

I Claim:

1. An apparatus for reducing the aerodynamic base drag of a bluff body having a leading end, a trailing end, a top surface, opposing left and right side surfaces, and a base surface at the trailing end substantially normal to a longitudinal centerline of the bluff body, said base surface joined to the left side surface at a left trailing edge, to the right side surface at a right trailing edge, and to the top surface at a top trailing edge, said apparatus comprising:

left and right vertical boattail plates orthogonally attached to the base surface of the bluff body and inwardly offset from the left and right trailing edges, respectively, to produce left and right vertical channels which generate, in a flowstream substantially parallel to the longitudinal centerline, respective left and right vertically-aligned vortical structures therein, said left and right vertical boattail plates each having a plate width defined by a rear edge spaced from the base surface, and a peak plate width at a location between top and bottom ends thereof, corresponding to a peak vortex of the respective vertically-aligned vortical structures.

2. The apparatus of claim 1,

further comprising an upper horizontal boattail plate orthogonally attached to the base surface of the bluff body and inwardly offset from the top trailing edge to produce an upper horizontal channel which generates, in the flowstream, an upper horizontally-aligned vortical structure therein, said upper horizontal boattail plate having a plate width defined by a rear edge spaced from the base surface, and a peak plate width at a location between left and right ends thereof, corresponding to a peak vortex of the upper horizontally-aligned vortical structure.

3. The apparatus of claim 1 or 2,

wherein the rear edges of the boattail plates are concavely curvilinear.

4. The apparatus of claim 1 or 2,

wherein the rear edges of the boattail plates are angled to produce wedge-shaped boattail plates.

5. An apparatus for reducing the aerodynamic base drag of a bluff body having a leading end, a trailing end, a top surface, opposing left and right side surfaces, and a base surface at the trailing end substantially normal to a longitudinal centerline of the bluff body, said base surface joined to the left side surface at a left trailing edge, to the right side surface at a right trailing edge, and to the top surface at a top trailing edge, said apparatus comprising:

left and right vertical boattail plates orthogonally attached to the base surface of the bluff body and inwardly offset from the left and right trailing edges, respectively, to produce left and right vertical channels which generate, in a flowstream substantially parallel to the longitudinal centerline, respective left and right vertically-aligned vortical structures therein, said left and right vertical boattail plates having a non-rectangular geometry with a peak plate width at a location between top and bottom ends of said vertical plates.

6. The vehicle attachment of claim 5,

further comprising an upper horizontal boattail plate orthogonally attached to the base surface of the bluff body and inwardly offset from the top trailing edge to produce an upper horizontal channel which generates, in the flowstream, an upper horizontally-aligned vortical structure therein, said upper horizontal boattail plate having a non-rectangular geometry with a peak plate width at a location between left and right ends of said upper horizontal boattail plate.

7. The vehicle attachment of claim 5 or 6,

wherein said boattail plates have a concavely curvilinear geometry.

8. The vehicle attachment of claim 5 or 6,

wherein said boattail plates have a triangular geometry.

9. A vehicle attachment for reducing the aerodynamic base drag of a bluff body having a leading end, a trailing end, a top surface, opposing left and right side surfaces, and a base surface at the trailing end substantially normal to a longitudinal centerline of the bluff body, said base surface joined to the left side surface at a left trailing edge, to the right side surface at a right trailing edge, and to the top surface at a top trailing edge, said apparatus comprising:

left and right vertical boattail plates orthogonally connectable to the base surface of the bluff body so as to be inwardly offset from the left and right trailing edges, respectively, and produce left and right vertical channels which generate, in a flowstream substantially parallel to the longitudinal centerline, respective left and right vertically-aligned vortical structures therein, said left and right vertical boattail plates each having a plate width defined by a rear edge spaced from the base surface, and a peak plate width at a location between top and bottom ends thereof, corresponding to a peak vortex of the respective vertically-aligned vortical structures.

10. The vehicle attachment of claim 9,

further comprising an upper horizontal boattail plate orthogonally attached to the base surface of the bluff body and inwardly offset from the top trailing edge to produce an upper horizontal channel which generates, in the flowstream, an upper horizontally-aligned vortical structure therein, said upper horizontal boattail plate having a plate width defined by a rear edge spaced from the base surface, and a peak plate width at a location between left and right ends thereof, corresponding to a peak vortex of the upper horizontally-aligned vortical structure.

11. The vehicle attachment of claim 9 or 10,

wherein the rear edges of the boattail plates are concavely curvilinear.

12. The vehicle attachment of claim 9 or 10,

wherein the rear edges of the boattail plates are angular to produce wedge-shaped boattail plates.

13. In a bluff body land-based vehicle having a leading end, a trailing end, a top surface, opposing first and second side surfaces, and a substantially flat base surface at the trailing end substantially normal to a longitudinal centerline of the bluff body, the improvement comprising:

means located alongside at least one of the top surface and first and second side surfaces for generating, in a flowstream substantially parallel to the longitudinal centerline, a pair of counter-rotating vortices which confluence together downstream in the wake of the vehicle in a direction orthogonal to the flowstream such that the confluence induces the flowstream passing over the top surface to turn down and around behind the trailing end to raise the pressure on the base surface and reduce the aerodynamic base drag.